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NAVY DEPARTMENT

BUMED NEWS LETTER

a digest of timely information

EDITOR - COMDR. F. R. BAILEY, (MC) U. S. N. R.

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Penicillin in the Treatment of Yaws: The Medical Department of the Navy is conducting on Samoa an investigation of the effectiveness of penicillin in the treatment of yaws. A preliminary report of this study, (Bumed News Letter, Dec. 8, '44), presented evidence that penicillin was effective in yaws, as it is

in syphilis, in producing rapid disappearance of the clinical manifestations of the disease. At the time this report was made, it was too early in the course of the investigation to draw any definite conclusions as to the resultant serological changes, but it appeared that following treatment with penicillin there was a tendency toward reduction in titer of the positive quantitative Kahn reaction.

A second report has recently been received by the Bureau which concerns observations made by the research group on Samoa during a period of about three months following the preparation of the preliminary report.

Twelve more early cases and 15 late cases have been added to the series. There are now 37 early and 27 late cases under study. All cases after being discharged from the hospital are followed as closely as possible, clinical examinations being made and quantitative Kahn tests performed at two-week intervals.

The only clinical developments noted, scabies, pustular skin eruptions, and abrasions of the skin were apparently not associated either with yaws or its treatment.

Up to the time of the recent report there had been no clinical relapse or recurrence of yaws in any of the patients treated with penicillin. Later, however, two patients (one early and one late case) developed ulcers in the scars of previous yaws lesions. These scars were on the lower extremities and in areas subject to trauma. Each patient was hospitalized, and repeated darkfield examinations were made, with negative results. Following rest in bed and simple surgical care the ulcers healed.

In spite of the rapid clinical improvement, the quantitative Kahn tests of these patients have not shown a tendency toward early reduction in titer of the positive reaction. Indeed, there has been no uniformity in the serological pattern. Most patients have had a noticeable reduction in titer only to have subsequent tests become more positive. However, the general tendency over the period of observation in all cases but one has been toward a reduction in titer of the positive reaction. (It is possible that this lack of uniformity in the course of the Kahn response may be due to the presence of concomitant infections giving rise to false-positive reactions. Ed.)

It is too early to predict the eventual effect of penicillin on the positive Kahn reactions in these patients. It is planned to add cases to the series until a total of 60 early and 30 late cases are under observation and to follow them with repeated clinical examinations and quantitative Kahn tests over a period of about two years. (Research Project X-378 (Gen. 56). Summary of Research to Jan. 26, '45; J. K. Gordon)

Penicillin in Weil's Disease: The effectiveness of penicillin in the treatment of guinea pigs infected experimentally with Leptospira icterohemorrhagiae was mentioned in the Bumed News Letter of April 14, 1944. Clinical trial of penicillin in the therapy of Weil's disease in man has been made in a number of instances. A few reports now are available regarding the treatment of small numbers of cases. However, no series is large enough for adequate appraisal on a basis of controlled studies.

In a series of five cases reported to the British Medical Research Council, penicillin appeared not to be effective. On the other hand, Bulmer has recently reported (Brit. M. J., Jan. 27, '45) six cases of Weil's disease which appeared to be benefited by penicillin. In Bulmer's cases penicillin seemed to shorten the febrile stage and to diminish the number of febrile relapses. As would be expected, it did not influence the degree and duration of the jaundice or retention of nitrogen, and it did not hasten the disappearance of albuminuria. It would be expected that if penicillin is to be effective in Weil's disease, it must be given early and in adequate dosage in an effort to limit damage to the parenchyma of the liver and kidneys.

In view of the conflicting evidence with regard to the efficacy of penicillin in spirochetal jaundice, reports of its use in the therapy of this disease in the Navy would be welcomed by the Bureau.

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Oxygen Poisoning: Historical: That oxygen may produce toxic symptoms when breathed under increased pressures is not a recent discovery. Paul Bert in his classic experiments about 1873 showed that animals placed in a closed chamber under pressure with various oxygen concentrations manifested toxic symptoms terminating in convulsions and death. These symptoms came on earlier and with increased severity when the partial pressure of oxygen was increased.

The term "oxygen poisoning" itself was proposed by Paul Bert. Since his time, particularly recently, considerable research has been done on this interesting physiological and pathological effect of oxygen. However, little has been added to the original findings and concepts of this ingenious investigator of over 70 years ago.

Practical Uses of Oxygen: The subject of oxygen poisoning has assumed great importance during recent years particularly in the fields of (1) deep sea diving, where the toxic effects of oxygen may become manifest during deep dives using air or helium-oxygen mixtures, (2) shallow diving, utilizing pure oxygen with either the open mask or the self-contained unit, or (3) treatment of compressed-air illness, where oxygen is employed either in the pure or mixed state.

Oxygen administered at normal barometric pressures is extensively employed therapeutically for the alleviation of anoxic symptoms. In aviation medicine it is used prophylactically prior to take-offs on high altitude flights for the purpose of denitrogenation to prevent aeroembolism. During high-altitude flights it is imperative that it be breathed routinely at altitudes of more than 12,000 feet to prevent anoxia. However, the danger of oxygen poisoning at these levels is much less than it is in diving, because of the relatively lower partial pressures encountered at high altitude.

It is therefore highly important that all personnel assigned to duties involving diving be thoroughly acquainted with the early symptoms of oxygen poisoning. They should know what are the maximal pressures and time limits that can be safely tolerated, since they are the individuals directly concerned with this hazard.

Symptoms: The early signs and symptoms of oxygen poisoning in man manifested in 192 instances among 338 various types of oxygen dives, made at the Experimental Diving Unit of the Navy Yard, Washington, D. C. and the National Naval Medical Research Institute, Bethesda, Maryland, were, in order of their frequency: (1) anxiety, "inward trembling", or nervous irritability; (2) marked pallor of the skin; (3) paresthesias, particularly in the tips of the fingers and toes and in the circumoral area of the face; (4) periodic waves of nausea, often followed by vomiting; (5) dizziness; (6) visual disturbances, as pupillary dilatation and tubular vision or loss of lateral vision; (7) tinnitus; (8) muscular twitchings, most commonly of the facial muscles; and (9) convulsions. The convulsion may or may not be preceded by any of the other warning signs or symptoms. It is generalized, clonic or tonic in character, closely resembles the epileptiform seizure and, like the latter, is followed by postconvulsive symptoms of headache, mental torpidity, disorientation and drowsiness. The striking feature of poisoning by oxygen is the variability of the onset and the type and frequency of symptoms, not only among different individuals, but also in the same individual exposed at different times to the same increased oxygen tension under identical environmental conditions. It has been noted that an individual who can tolerate oxygen without any symptoms at a pressure of 60 feet on one day will, on another day, have a convulsion at 40 feet after the same period of exposure. Apparent recovery from symptoms of oxygen poisoning is quickly and dramatically brought about by substituting air for the oxygen or by lowering the pressure at which the oxygen is breathed, thereby indicating that a rapidly reversible physiological process takes place.

Tolerance: The variability of oxygen tolerance among different individuals or in the same individual at different times has been mentioned. Brief intermittent periods of air breathing interspersed throughout the period of oxygen administration definitely prolong the time that increased pressure and

concentration of oxygen can be tolerated. It has also been noted that an increase in the carbon dioxide content of the breathing medium, as well as an elevation in the partial pressure of carbon dioxide in the tissues, presumably play a considerable role in decreasing oxygen tolerance.

The influence of other factors on tolerance time is illustrated in the accompanying table. With few exceptions, healthy men at rest in a dry chamber can breathe pure oxygen at a depth of 60 feet for two hours without symptoms of oxygen toxicity, but serious symptoms of oxygen poisoning appear after an average time of 10 minutes when moderate work is performed at this depth. Another interesting finding is that toxic symptoms are less often experienced during dives in the dry chamber than they are at the same pressure under water. This may be due in part to slight mask leakage around the face in the dry chamber. In the case of working dives under water, the incidence of toxic symptoms is less in those subjects using a self-contained breathing system (carbon dioxide concentration being kept at a minimum by means of an absorbent) than in those who use a free-flowing exhaust type of mask. This probably is the result of dilution of the oxygen in the self-contained outfit by the nitrogen eliminated from the body and retained in the closed system.

As mentioned in the Bumed News Letter of May 14, 1943, the period of time that pure oxygen can be safely breathed at sea-level pressures is still debatable. Here, too, the tolerance of different individuals varies. Patients with cardiac insufficiency or other diseases accompanied by anoxic symptoms appear to tolerate oxygen better than healthy subjects. Reports of long periods of oxygen breathing at sea level can be found in the literature, but such reports usually reveal that the inhalation was interrupted or the concentration reduced for short periods during meals or when nursing procedures were carried out. However, it is again emphasized that oxygen therapy as clinically employed is usually well within the limits of tolerance. Stadie, in his review of the literature, concludes that the maximal concentration of oxygen which can be safely inhaled for indefinite periods appears to be 0.6 atmospheres (60 per cent at sea level). Oxygen at one atmosphere (100 per cent sea level) should not be administered continuously for more than 24 hours. Behnke states that oxygen of one atmosphere can in most cases be inhaled for 17 hours without injury, although some subjects have complained of substernal distress in 7 hours.

In summary, the following are the maximal pressures and durations which may be tolerated with relative safety when pure oxygen is used in diving: (a) for water dives with minimal exertion - 60 feet for not longer than 30 minutes; (b) for water dives with work performed - 30 feet for not more than 60 minutes. When the self-contained underwater outfit is used, it is imperative that fresh carbon-dioxide absorbent be supplied prior to each dive and that extreme care be exercised to keep this absorbent dry throughout the period of use. In the

TABLE OF OXYGEN DIVES

DEPTH	DRY CHAMBER		UNDERWATER		
	REST Open Circuit	WORK Open Circuit	REST Open Circuit	WORK Open Circuit	WORK Closed Circuit
30 ft.				18 2-hr. dives 1 case (5.6%) 111 minutes	17 2-hr. dives 1 case (5.9%) 87 minutes
40 ft.	32 2-hr. dives No symptoms			23 2-hr. dives 8 cases (35%) 69 minutes	48 2-hr. dives 11 cases (23%) 44 minutes
50 ft.					5 2-hr. dives 3 cases (60%) 32 minutes
60 ft.	11 2-hr. dives No symptoms	13 1-hr. dives 13 cases (100%) 10 minutes	20 2-hr. dives 8 cases (40%) 62 minutes		
80 ft.	48 2-hr. dives 37 cases (77%) 50 minutes		67 1-hr. dives 67 cases (100%) 37 minutes		
100 ft.	29 1-hr. dives 26 cases (90%) 27 minutes		20 1-hr. dives 20 cases (100%) 18 minutes		

Minutes indicate average time at onset of symptoms.

recompression chamber where oxygen is used in the treatment of compressed-air illness, the maximal safe duration of time and "depth" for oxygen therapy are not more than 2 hours at 60 feet with the individual at complete rest. If the oxygen is not tolerated at the 60 and 50-foot levels, it is usually safe to continue its administration at the 40 and 30-foot levels. (From the Experimental Diving Unit - Navy Yard, Washington. - O. E. Van Der Aue)

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The Nutritional Composition of Rations: Certain Army emergency rations are used by the Navy and Marine Corps. The table reproduced below gives the composition of some of these rations with respect to certain essential nutritional elements:

Ration	Calories	Protein (gm)	Fat (gm)	Carbohydrate (gm)	Calcium (gm)	Iron (mg)	Vitamin A (i. u.)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Ascorbic acid (mg)
Field ration B	3, 915	122	141	532	0. 996	27	9, 430	1. 98	2. 42	26. 7	103
C ration:											
Up to July 1944	2, 775	121	78	379	. 818	33	18, 370	1. 0	1. 8	28	87
July to October 1944	3, 240	143	114	410	. 800	24	9, 450	2. 5	3. 0	28	80
October through December 1944	3, 396	143	122	436	. 800	22	5, 410	2. 8	3. 0	29	72
1 January 1945 forward	3, 709	148	132	482	. 925	23	5, 430	2. 7	3. 0	28	112
10-in-1 ration:											
April to December 1944	3, 927	124	171	473	1. 310	22	5, 220	2. 3	2. 7	24	80
1 January 1945 forward	4, 150	130	170	525	1. 150	25	3, 100	2. 7	3. 6	26	75
K ration:											
June to December 1944	2, 786	89	129	317	1. 282	14	4, 674	2. 1	2. 4	15	65
1 January 1945 forward	2, 860	93	122	343	1. 350	17	4, 695	1. 8	2. 5	17	70
D ration	1, 770	32	95	200	. 700	10. 8	-------	1. 50	0. 50	1. 2	------
Recommended daily allowances [1]	[2] 3, 000	70	------	------	. 800	12	5, 000	1. 80	2. 70	18	75
Minimum daily allowances [1]	[2] 3, 000	50	------	------	. 600	6	3, 000	1. 00	1. 50	10. 0	50

[1] Food and Nutrition Board, National Research Council.
[2] For a man of 70 kilos, moderate activity. Calorie need will of course depend on energy expenditure.

(War Dept. Tech. Bull. - TB MED 141)

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It is apparent that the content of certain important items of nutrition is adequate in all of the rations except the D ration, which is intended only for emergency survival conditions and should be used only when other food supply is lacking.

It must be remembered that in order to obtain a balanced diet from one of these rations all of the food must be eaten. For example, in the K ration as well as in the 10-in-1 and C rations synthetic fruit beverage powders are included for the purpose of providing vitamin C, in which these rations are otherwise poor.

Actual Food Intake of Hospital Patients: Dietary histories were taken and measurements were made in two R.C.A.M.C. hospitals of the food intake of patients who had no evidence of disease of the gastrointestinal tract. These measurements were analyzed statistically. All aspects of hospital catering, including the food supplies, ordering of food, kitchen equipment, ability of cooks, methods of serving food and the attitude of the medical and nursing staffs and of the patients toward food intake were observed. In one typical hospital the results were as follows:

	Protein	Calories
Ration allowance	156 Gm.	4,135
Plate wastage	21 Gm. (13%)	772 (19%)
Underdrawn (or kitchen wastage)	81 Gm. (52%)	1,507 (36%)
Actually eaten by patient	54 Gm. (35%)	1,856 (45%)

(Report to the Nat'l Res. Council of Canada, Stevenson et al. - CMR Bulletin #26)

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Effect of Large-Scale Restaurant Operations on Vitamin Content of Potatoes: A detailed report is presented on the vitamin content of potatoes, and on the losses incurred in various large-scale cooking and serving operations. "Significant losses of all vitamins occurred during peeling. Significant losses of ascorbic acid, as total and reduced, occurred in the mashing and holding after mashing." Ascorbic-acid content was not significantly altered by steaming alone, and thiamine, riboflavin and niacin were not significantly reduced in amount by the steaming, mashing and holding procedures employed. (OEMcmr-474, Progress Report #2, Koch, Pentagon Post Restaurant Council, CMR Bulletin #25)

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A Guide to Chemotherapy: The field of chemotherapy is expanding rapidly, and the addition to our therapeutic armamentarion of a number of new chemotherapeutic and antibiotic compounds may lead to some confusion as to which is the drug of choice in certain instances. The tables presented below have been compiled following a comprehensive review of the literature and in the light of deductions made from experiences with therapy in the Armed Forces.

An attempt is made to furnish a practical guide to therapy. The first table lists those organisms sensitive to penicillin and those resistant to it. A list of organisms thus far found to be susceptible to the action of streptomycin, in vivo and in vitro, is included for general information. This drug is not available for clinical use.

The second table consists of a list of diseases, arranged in alphabetical order, the response of which to sulfonamide and penicillin therapy has been tested. Opposite each disease is indicated the effectiveness of one or the other agent and which is the agent of choice.

Obviously, in view of the currently rapid progress in the field of chemotherapy and antibiotic therapy, any such data must be revised as new information and new compounds are obtained.

CHART I

Sensitive to Penicillin	Insensitive to Penicillin	Sensitive to Streptomycin (in vitro and in vivo)
Diplococcus pneumoniae	E. typhosa	E. typhosa
Staph. aureus	S. paratyphi	Br. abortus
Staph. albus (some strains)	S. enteritidis	M. tuberculosis
N. gonorrhoeae	Proteus vulgaris	E. coli
N. intracellularis	Ps. aeruginosa (B. pyocyaneus)	Shigellae
Actinomyces bovis	Serratia marcescens (B. prodigiosus)	P. pestis
B. anthracis	H. influenzae	Proteus vulgaris
B. subtilis	H. pertussis	Strep. hemolyticus
Cl. botulinum	H. ducreyi	Staph. aureus
Cl. tetani	E. coli	
Cl. welchii	Staph. albus (some strains)	
Cl. septicum	Micrococcus albus (some strains)	
C. diphtheriae	Blastomyces	
Micrococci (most strains)	M. tuberculosis	
Streptobacillus moniliformis	Strep. faecalis	
Borrelia Novyi (spirochete of relapsing fever)	Brucellae	
Treponema pallidum	Kl. pneumoniae	
L. icterohaemorrhagiae	P. pestis	
Spirillum minus	P. tularensis	
Psittacosis virus	Plasmodium vivax	
Ornithosis virus	Toxoplasma	
Strep. hemolyticus	Vibrio cholerae	
Non-hemolytic streptococcus (most strains)	Yeasts	
Strep. viridans (most strains)	Molds	

CHART II

DISEASES AND THEIR RESPONSE TO CHEMOTHERAPY

KEY: Drug of Choice ++ Favorable response +
Value undetermined ± No value 0

Disease	Sulfadiazine	Penicillin
Abscesses and carbuncles	+	++
Actinomycosis (1)	+	++
Anaerobic strep. infections		++
Anthrax (2)		++
Arthritis		
Gonococcal	+	++
Rheumatoid	0	0
Blastomycosis (3)	0	0
Chancroid	++	±
Cholera	±	0
Coccidiomycosis	±	0
Colitis, ulcerative (4)	±	0
Diphtheria	+	++
Dysentery		
Flexner	++	0
Shiga	±	0
Salmonella enteritidis	0	0
Empyema		
Pneumococcal	+	++
Staphylococcal	+	++
Encephalitis	0	0
Endocarditis (5)		
Gonococcal	+	++
Pneumococcal	±	++
Staphylococcal	±	++
Strep. hemolyticus	±	++
Strep. viridans (6)	±	++
Filariasis	0	0
Gas Gangrene		
Cl. welchii and Cl. septicum	+	++
Cl. oedematiens	0	++
Gonorrhea	+	++
Granulocytopenia (7)	+	++
Granuloma inguinale	±	0
Hemolytic strep. infections	+	++
Hepatitis, epidemic	0	0
Histoplasmosis	±	0
Hodgkin's disease	0	0
Influenza	0	0
Leprosy	0	0
Leptospirosis (Weil's disease) (5)	0	++
Leukemia	0	0
Lupus erythematosus	0	0
Lymphocytosis, acute infectious	0	0
Mastoiditis	+	++
Measles	0	0
Meningitis		
Meningococcal (8)	++	++
Pneumococcal (9)	++	++
Staphylococcal (5)		++
Strep. hemolyticus	+	++
Moniliasis (3)	0	0
Mononucleosis, infectious	0	0
Mumps	0	0
Ophthalmia		
Gonococcal	+	++
Ornithosis	0	±
Osteomyelitis		
Staphylococcal		++
Pemphigus (10)	+	0
Peritonitis		
Mixed	+	++
Gonococcal	+	++
Pneumococcal	+	++
Staphylococcal	+	++
Strep. hemolyticus	+	++

Disease	Sulfadiazine	Penicillin
Plague	+	0
Pneumonia		
Pneumococcal	+	++
Staphylococcal	+	++
Strep. hemolyticus	+	++
Virus (11)	0	±
Poliomyelitis	0	0
Psittacosis	0	±
Puerperal sepsis	+	++
Q Fever	0	0
Rabies	0	0
Rat Bite Fever		
Spirillum minus (2)	0	++
Streptobacillus	0	++
Relapsing fever (5)	0	++
Rheumatic fever	0	0
Rocky Mountain		
Spotted Fever	0	0
Salmonella infections		
S. paratyphi (para A)	0	0
S. schottmuelleri (para B)	0	0
Sinus thrombosis (5)	+	++
Staphylococcal infections	+	++
Syphilis (12)	0	++
Tetanus	0	++
Toxoplasmosis	±	0
Trichinosis	0	0
Tsutsugamushi disease	0	0
Tuberculosis	0	0
Tularemia	±	0
Typhoid fever	0	0
Typhus fever	0	0
Undulant fever (Brucella)	±	0
Yellow fever	0	0

Footnotes:

(1) Potassium iodide effective but not preferable to penicillin.
(2) Arsenicals effective but not preferable to penicillin.
(3) Potassium iodide is drug of choice.
(4) Sulfonamides useful in controlling secondary infection.
(5) Requires two to three times the dosage of penicillin usually given.
(6) Subacute bacterial endocarditis (Strep. viridans) requires 300,000 units of penicillin daily for 21 days.
(7) Secondary infection in granulocytopenia not due to sulfonamides may respond to sulfonamides, but penicillin is recommended.
(8) Sulfadiazine and penicillin are equally effective, sulfadiazine being simpler to administer. When penicillin is used, it must be given intramuscularly in usual dosage, as well as intrathecally 10,000 units daily. Combined therapy is indicated in the fulminating type.
(9) Best results from combined sulfadiazine and penicillin therapy.
(10) Arsenicals also useful.
(11) Penicillin often helpful but response unpredictable.
(12) Ideal penicillin dosage not determined. For the present the recommended 40,000 units every 3 hours for 60 doses should be used.

No mention has been made in the above table of the use of sera and antitoxins which in certain conditions are the therapeutic agents of choice and in others should be used as adjuncts to therapy with penicillin or sulfonamide or both.

Sulfadiazine is at present considered the sulfonamide of choice whenever the action of the drug depends on its concentration in the blood and tissues and when idiosyncrasy to it does not exist.

Sulfasuxidine (succinylsulfathiazole) is preferred to sulfaguanidine. These poorly absorbed sulfonamides have a limited range of usefulness, but may be of value under the following purposes:

1. Reducing the number of bacteria in the intestinal tract -
   (a) Preparatory to operations on the large intestine or rectum;
   (b) In the presence of wounds in the region of the buttocks or rectum to lessen contamination of the feces.
2. In eliminating the carrier stage of S. sonnei infections.

The usual initial dose of sulfadiazine is 4 Gm. Ordinarily this is followed by 1 Gm. every 4 hours. Average dosage of penicillin varies from 80,000 units to 120,000 units per 24 hours. The intervals between individual intramuscular injections of penicillin should not be more than three hours, if an effective level is to be maintained. In general, higher dosage schedules must be used in fulminating infections or in conditions where the pathogenic organism is relatively resistant, as indicated in the second chart.

The topical application of sulfonamides is of limited usefulness. It is not considered of value in the presence of established surgical infection. It may be of some value immediately after wounding in those cases when a considerable delay may occur before definitive surgery can be carried out. For local application only sulfanilamide is recommended.

Penicillin is indicated for irrigation of deep sinuses leading down to infected bone, and for instillation into empyema cavities, infected paranasal sinuses, and suppurative joints. Local use must be combined with general administration.

Both drugs may have a limited use as topical application in the treatment of infections of the eye. (Prof. Div., BuMed. - A. G. Lueck)

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A Pyrogenic Factor Isolated from Inflammatory Exudate: In a series of studies on inflammation, Menkin has demonstrated in inflammatory exudates the presence of a leukocyte-promoting factor called leukotoxin and a toxic inflammation-producing substance called necrosin.

Recent observations by this investigator indicate that there is also a pyrogenic factor in inflammatory exudate. This factor, termed pyrexin, is found to

be associated largely with the relatively insoluble component of the whole euglobulin fraction of exudative material. It appears to be a proteolytic-split product produced by the action of necrosin which, in its present state of purification, displays proteolytic activity and may even be an enzyme. Purified necrosin seems to be either a true euglobulin or at least a substance linked with that protein fraction of exudate. It is nonpyrogenic. (For other items on necrosin see Bumed News Letter, Vol. 1, No. 2, page 11, and Vol. 3, No. 4, page 12.)

The chemical nature of pyrexin is still unknown. It is insoluble in distilled water, in isotonic solution of NaCl and in the presence of ammonium sulphate. It is soluble in relatively weak alkalies but is insoluble in strong acid. It is indiffusible and is heat stable.

Pyrexin is essentially absent in normal non-hemolyzed blood serum, but it is present to some extent in hemolyzed serum and also in the serum of an animal with a concomitant inflammation. In experiments on dogs in which an experimental progressive inflammatory reaction was produced in the pleural cavity, a pyrogenic factor was recovered in increasing amounts from urine.

It is believed that pyrexin offers a reasonable explanation for the primary mechanism of the fever frequently accompanying inflammation. Preliminary studies suggest that its mode of action may possibly be via the hypothalamic heat-regulating centers. (Arch. Path., Jan. '45)

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Pentothal Anesthesia: In the May 1944 Bulletin of the U. S. Army Medical Department, attention was directed to a report from overseas on pentothal anesthesia, which brought to light a high death rate attributable to sodium pentothal. In this article the opinion was expressed that this high death rate was the result of the occasional unwise use of pentothal rather than to its inadequacy as an anesthetic for use in the Armed Forces. (See Bumed News Letter, May 26, '44.) Another report from the same overseas theater has been submitted which compares present experience with that previously recorded and demonstrates the improvement that has been achieved through education in the more rational use of this anesthetic agent. It is stated that a year ago the death rate from pentothal anesthesia was so high that the question was raised of abandoning the agent. Examination of the fatalities that occurred, however, indicated that two conditions exist which lend themselves to correction: (1) the use of pentothal by completely inexperienced individuals, and (2) its use in cases in which pentothal was actually contraindicated. Because of the advantages of the use of pentothal in military surgery, the decision was made to continue its employment, at the same time taking measures to correct these two factors.

The collected data show that whereas the overall pentothal death rate a year ago was 1 to 450, the present rate is 1 to 5,500. That this great decrease

in the death rate from pentothal anesthesia has not come about at the expense of abandoning pentothal is shown by the fact that although a year ago this agent was employed in 53 per cent of the cases requiring anesthesia, at present it is employed in 62 per cent of these cases in the forward hospitals. The figures for the hospitals in the rear are 28 and 48 per cent respectively. Thus despite the fact that the relative use of pentothal as compared with other anesthetics has actually increased during the past year, a great reduction in the anesthesia death rate has occurred, clearly showing how well, through education and experience, the intelligent application of this anesthetic has been effected. As previously emphasized, pentothal has proved especially valuable as an anesthetic in military surgery in procedures in which relaxation is not essential, and particularly in short (half-hour) operations and those on individuals in good condition. The routine use of atropine as preanesthetic medication, the administration of oxygen throughout the period of anesthesia, and frequent observations of pulse and blood pressure during the anesthesia are considered important factors in the safe use of pentothal. The employment of pentothal should be avoided when the operative position or procedure may interfere with the airway or make respiration difficult, as in the case of operations performed in the face-down position and operations on maxillofacial injuries, or infection about the neck, and other conditions involving the airway. Pentothal is not considered a wise choice in intracranial surgery, in burns, and in conditions in which it is believed that liver damage may exist. (Bull. U. S. Army M. Dept., Feb. '45)

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Effects of Bed Rest on Healthy Young Men: Simple bed rest, in the absence of disease or injury, produces a variety of metabolic and functional alterations many of which are deleterious and are similar to the changes associated with debility in disease or following injury.

Simple bed rest for about three or four weeks consistently produces the following changes which are considered to be important: reduction in the total volume of circulating blood; relative tachycardia in all conditions including basal rest; reduction in the size of the heart both in systole and in diastole; decrease in vasomotor adjustment to postural changes; electrocardiographic changes indicating decreased resistance of the heart to postural stress; decreased capacity to transport oxygen in work; increased lactacidemia and pyruvinemia during and following muscular work; decreased respiratory efficiency; decreased proprioceptor adjustment to posture; decreased intestinal tone and constipation; decreased endurance for simple muscular work; relative negative balance for nitrogen; relative negative balance for potassium; increased excretion of thiamine and of riboflavin in the urine; and decreased coordination in bodily movements.

Simple bed rest up to three or four weeks produces no changes or only small and relatively unimportant changes in the following: simple muscular

strength, thermodynamic efficiency in walking or running; the relation of oxygen debt following work to blood lactate; the composition of the blood; the basal metabolism; the rectal temperature; speed of small movements; the blood flow through the kidneys; the fusion frequency of flicker; and the calcium and phosphorus balance.

No individual fitness test yet tried has more than a small correlation with total fitness, and the significance of the several fitness tests and indices must be evaluated separately with reference to the particular function or functions concerned.

In general, after three or four weeks of simple bed rest a considerable restoration of lost or deteriorated functions will be gained in the first four days out of bed, but full restoration, even with a physical training program, takes at least several weeks. The aberrations in nitrogen, potassium, thiamine and riboflavin balances are almost immediately redressed. Blood volume and work-pulse rate require weeks for restoration. (OEMcmr- 413; Keys - Univ. of Minn. - CMR Bulletin #27)

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Meningococcal Infections - Bacteriology: The hemorrhagic rash characteristic of the early phase of meningococcemia may be difficult to differentiate from other types of purpura. In view of the importance of early institution of sulfonamide chemotherapy in meningococcal infections, a rapid method of diagnosis is desirable. A paper by Bernhard and Jordan calls attention to the fact that meningococci can often be demonstrated in smears from the purpuric lesions of patients with cerebrospinal fever.

The authors describe their technic as follows: After cleansing the purpuric area with alcohol, a needle puncture is made by inserting an ordinary 20 gauge needle into the center of the petechial spot at an angle almost parallel with the surface of the skin. After withdrawal of the needle, the skin surface should be scratched over the purpuric area until a slight oozing of blood is obtained. Gentle pressure around the area will produce sufficient blood and serum so that, using a sterile platinum loop, smears and cultures may be made.

Using this technic meningococci were demonstrated in smears from the purpuric lesions in 67.5 per cent of 40 cases of cerebrospinal fever and on culture in 87.5 per cent.

Bernhard and Jordan also describe a medium which in their hands gave excellent results in the cultivation of meningococci and gonococci. They describe its preparation as follows:

14.0 Gm. Bacto dextrose proteose No. 3 agar
15.3 Gm. Bacto nutrient agar
3.2 Gm. soluble starch

Dissolve above in 1,000 c.c. of water and autoclave. Bring the medium to a temperature of 90°C. and add 5 per cent of rabbit or human blood. Dispense under sterile conditions into 6-inch test tubes, and slant.

They found that the culturing of fairly large quantities of spinal fluid was necessary to obtain satisfactory results. At the same time, it was noticed that organisms from less purulent fluids grew more readily than those from fluids with very high cell counts. They therefore made two sets of cultures of purulent fluids. The uncentrifuged spinal fluid was inoculated, 1.0 c.c. into a brain heart infusion broth and 0.5 c.c. into the starch chocolate agar slant, described above. The remaining portion was centrifuged; the supernatant fluid was poured into a tube of broth, and a slant was inoculated with the entire sediment. In many cases growth was obtained on both sets of cultures, but in several instances colonies developed only on the medium inoculated with the unsedimented fluid. Their blood-culture method has been the inoculation of 100 c.c. of brain heart infusion broth with 10 c.c. of blood, and in certain cases a poured plate also was made, using an enriched nutrient agar base to which was added 3 c.c. of blood. To counteract sulfonamide, para-aminobenzoic acid, 50 mg. per liter of media, was added.

To supply the carbon dioxide requirements of the meningococcus, 1 Gm. of sodium bicarbonate and 100 c.c. of 3 per cent sulphuric acid were added for each 2,500 c.c. volume of the incubation jar, using an ordinary mason jar. (J. Lab. & Clin. Med., March '44)

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Biochemical Activity of the Malaria Parasite: Plasmodium gallinaceum can be used satisfactorily for the experimental study of the metabolism of the erythrocytic phase in the development of the malaria parasite.

Technics have been devised for obtaining washed suspensions of parasitized chicken erythrocytes and of estimating the active parasitic mass present in such suspensions. It is possible to show that such suspensions oxidize glucose with the intermediate formation of lactic and pyruvic acids. Some 20 or 30 per cent of the glucose used by the organisms cannot, as yet, be accounted for, although such possibilities as the conversion of this missing glucose into fat, cholesterol, etc., have been explored.

Under anaerobic conditions the organism retains its infectivity, provided sufficient quantities of glucose are present. Under these circumstances the

glucose used can be accounted for quantitatively as lactic acid. The study of cell-free extracts of the parasite has demonstrated that the process of forming lactic acid from glucose by the parasite proceeds by a mechanism similar to, or identical with, the phosphorylating glycolysis that occurs in mammalian muscle and other tissues.

Simultaneously with the aerobic utilization of glucose by the plasmodium there occurs an intensive breakdown of intracellular protein (hemoglobin) to give large increases in amino nitrogen. This proteolytic breakdown is apparently coupled with the aerobic utilization of glucose, since it is inhibited by anaerobiosis or agents tending to inhibit the oxygen uptake of the organism. Also, it has been possible to prepare cell-free extracts from the parasite capable of hydrolyzing hemoglobin.

The oxidation of lactic and pyruvic acids to carbon dioxide and water by the parasite is catalyzed by small amounts of fumaric acid and is inhibited by malonic acid. It seems probable, therefore, that the oxidative removal of pyruvic acid by the parasite follows a mechanism similar to the tricarboxylic-acid cycle of carbon oxidation in mammalian muscle.

Studies have been made of the effect of atabrine and quinine on the various enzymes of the system discussed above. A concentration of 0.001 M quinine inhibits the overall process of lactate formation from glucose by enzyme extracts from the parasite as well as by the enzymes, hexokinase and lactic dehydrogenase, which are part of the glycolytic mechanism. However, it seems improbable that sufficient concentrations to cause these effects are obtained in vivo. With "physiological" concentrations of quinine the principal effect seems to be on the mechanisms of pyruvate oxidation. It should be possible, therefore, to localize the effect of the drug on the enzyme system of the parasite if complete information about the mechanism of pyruvate oxidation becomes available. (OEMcmr-77 - Speck & Evans, Jr., Univ. of Chic. - CMR Bulletin - to be published.)

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Rate of Digestion of Sucrose: There is a widespread impression that in providing fuel for immediate muscular work dextrose is superior to sucrose because, unlike the latter, it does not require digestion before it is absorbed from the alimentary tract. Patients with diabetes who require insulin and who suffer from hypoglycemic reactions are ideal subjects for testing the rapidity with which sucrose is hydrolized as well as the rapidity with which the products of this hydrolysis are absorbed from the alimentary tract, by observation of (a) the subjective response to sucrose ingestion and (b) the rapidity with which the ingested sucrose increases the concentration of sugar in the blood. Blood-sugar time curves were, therefore, obtained in such

cases at one-minute intervals following ingestion of sucrose and, of the ten experiments reported here, a definite increase of blood sugar was noted within one minute in two cases, within two minutes in two cases, within three minutes in three cases, within four minutes in two cases and within five minutes in the remaining case. "Emotional" hyperglycemia was excluded as a possible cause of the increase of sugar noted. The combined data clearly demonstrate that, although sucrose must be hydrolyzed before it is available as a source of energy, the hydrolysis is very rapid. Sucrose is, therefore, as rapidly available as dextrose as a source of energy. (I. M. Rabinowitch, J. Nutrition, Feb. '45)

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Distribution of Amino Acids in Urine of Normal Men: Prior to undertaking a study of the excretion patterns of amino-acids in pathological conditions, Holt obtained data on their excretion in the normal male adult. To this end, 24-hour specimens from 25 normal adult males were analyzed for a number of the common urinary constituents as well as for 10 amino acids. The average distribution of these amino acids in per cent of the total amino nitrogen was found to be:

Arginine	2.4%	Tyrosine	4.6%
Histidine	9.4%	Phenylalanine	9.3%
Methionine	8.2%	Valine	12.0%
Cystine	1.3%	Leucine	20.0%
Tryptophane	4.8%	Isoleucine	0.0%

(OEMcmr-454, Progress Report #3 - Holt, Jr. & Albanese - Johns Hopkins Univ. - CMR Bulletin #26)

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Protection of Microscope Lenses from Fungi: A problem confronting workers in certain tropical areas has been the growth of fungi on and between the lenses of optical instruments. This growth etches the surface of the glass and eventually renders the instrument unusable. Berner suggests a method which may protect optical instruments from such damage for years. This consists simply in placing a small piece of cotton impregnated with creosote in an out-of-the-way corner of the microscope case. Care must be exercised as to where the cotton is placed because of the fact that creosote tends to remove the black paint from metal parts. The cotton need not be disturbed for as long as a year, when it will become necessary to soak it again in creosote. Camera lenses may be protected in the same manner. (Trop. Med. News, Feb. '45)

Chemical Agent Vapor Detector Kit: Vapor-detector kits are designed to detect the presence of and to identify certain war gases in concentrations sufficient to be dangerous. There are two types of kit available: (1) Chemical Agent Vapor Detector Kit M1 (Navy), and (2) Chemical Agent Vapor Detector Kit M9 (Army). They are supplied to naval vessels by the Bureau of Ships and to shore installations by the Bureau of Yards and Docks. They will be supplied also to any naval activity conducting training courses in chemical warfare.

The mechanism of action of the kit is as follows: Air to be tested is drawn by means of a pump or suction-bulb through a small glass tube containing a chemical reagent. This reagent will change color on contact with those gases which the tube is designed to identify. The change in color takes place immediately in certain tubes; in others to obtain the final color a liquid reagent must be added. Complete instructions for the use of each kit are furnished with it.

Gas masks should be put on and appropriate protective measures taken before tests are carried out.

The kits will detect the presence of certain gases in concentrations not perceptible by means of the olfactory sense. They are particularly valuable in detecting the presence of dangerous concentrations of the vapor of mustard. Owing to the presence of an odorous impurity in plant-grade mustard, the sense of smell cannot be trusted to determine the extent of contamination or the persistency of mustard gas. Chemical warfare personnel should be taught to regard the presence of the so-called mustard-gas odor as indicative only of possible contamination with this gas, and to rely on the results obtained by using the kit. The odor of nitrogen mustard is imperceptible except in high concentrations. Air over a contaminated area will not contain uniform amounts of vapor, because the concentrations in different localities will be influenced by temperature, velocity of the wind and distance from the contaminated surface. Therefore, samples should be taken at several points and at different distances from the surface.

The detector kits may be used to determine when it is safe to remove masks and when decontamination procedures have been adequate. They are useful in detecting the presence of leaking gas shells or containers by sampling the air of magazines. With them food, clothing and other articles in the field can readily be tested for vapor contamination.

The Navy Gas Detector Kit M1 will detect the presence of dangerous concentrations of the vapors of mustard, nitrogen mustard, lewisite, phosgene, hydrocyanic acid and cyanogen chloride. The Army Gas Detector Kit M9 will detect dangerous concentrations of the vapors of mustard, nitrogen mustard, lewisite, ethyldichlorasine, methyldichlorazine, phosgene and cyanogen chloride.

Chemical warfare vapor detector kits M1 and M9 are available at the following stations:

(a) Naval Supply Depot, Oakland, California
(b) Naval Supply Depot, Norfolk, Virginia
(c) FRAY-73
(d) LEFT-73
(e) EBON-73
(f) DISH-65

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Air Transportation of the Deaf: Patients with defective hearing requiring rehabilitation are currently being transferred to the U. S. Naval Hospital, Philadelphia, Pa. The Medical Officer in Command of that hospital has informed us that the condition of such patients may in certain instances be adversely affected when they are transported by air. In some the eardrums are found to be retracted, with hyperemia around the margin of the drum, around Shrapnell's membrane and along the manubrium. Such patients may complain of pain and a sensation of pressure in the ears lasting as long as three or four days, and during this period there may be further temporary reduction in auditory acuity. These symptoms may also have a deleterious effect on the patient's morale. Frequently, owing to such effects of altitude, a satisfactory audiometric measurement is not possible during the first six or seven days after arrival.

It is recommended that patients with defective hearing to be transferred to Philadelphia for rehabilitation not be transported by air. (Prof. Div., BuMed - G. C. Thomas)

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Normal Serum Albumin (Human), Stock No. S1-1945: The National Institute of Health now allows a five-year dating period of Normal Serum Albumin (Human), Stock No. S1-1945. All Serum Albumin now in stock having an expiration date ending in 1945, 1946 or 1947 should have this date extended two years. The dating period may eventually be extended beyond five years; therefore, Serum Albumin should not be discarded as out-dated without first obtaining instructions from the Bureau of Medicine and Surgery.

Official notification of the above is contained in an official dispatch to all ships and stations (Alnav 33-080425/33 of 8 Feb 1945). (Mat. Div., BuMed - K. C. Melhorn)

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Notice to Graduates of the Medical College of the State of South Carolina: This school is collecting data concerning all of its graduates who are in the Armed Services. All those who have not sent in the questionnaire contained in one of the issues of the Bulletin of the Medical College are requested to advise the Dean as to their full name, date of graduation, permanent home address, present address and rank. The letter should be addressed to the Dean, in care of The Library, Medical College of the State of South Carolina, Lucas Street, Charleston 16, South Carolina. All changes of address should be sent as well.

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Public Health Foreign Reports:

Disease	Place	Date	Number of Cases
Plague	Algeria	Dec. 10, '44	3
	Belgian Congo	Oct. 1-28, '44	12
	Madagascar	Dec. 1-20, '44	16
	Morocco (French)	Dec. 21-31, '44	15
	Senegal	Dec. 11-31, '44	3
Smallpox	British East Africa	Dec. 2-9, '44	83
	Rhodesia, Northern	Nov. 26-Dec. 2, '44	48
	Togo (French)	Dec. 11-20, '44	156
	Turkey	Jan. 1-6, '45	23
	Venezuela	Dec. '44	123 (6 fatal)
Typhus Fever	Algeria	Dec. 1-10, '44	69
	Egypt	Dec. 2-9, '44	148 (16 fatal)
	Greece	Aug.-Sept. '44	85
	Guatemala	Dec. 1-20, '44	83 (9 fatal)
Typhus Fever	Morocco (French)	Dec. 21-31, '44	29
	Peru	Nov. '44	63
	Rhodesia, Northern	Dec. 2-9, '44	25
	Turkey	Jan. 1-13, '45	200
	Venezuela	Dec. '44	8
Yellow Fever	Gold Coast, Nsawam	Dec. 16, '44	1 (fatal)
	Venezuela	Dec. '44	1 (fatal)
		Jan. '45	1 (fatal)

(Pub. Health Reps., Feb. 2 & 9, '45)

To: All Ships and Stations. BUMED-X-BLW:II
L5-2/JJ57

Subj: BAL in Oil and BAL Ointment in Treatment of Systemic Poisoning Caused by Lewisite and Other Arsenical Blister Gases, Use of. 10 Jan 1945

Refs: (a) BuMed ltr F34-5(052-37), 21 May 1943, Prevention and Decontamination of Mustard Gas and Lewisite Casualties by Use of S-461 Ointment and BAL Ointment, Directions for; N.D. Bul. Cum. Ed., 1943, 43-1094, p. 473.
(b) BuMed ltr A11/A16-3(093), 6 Jan 1944, Personal Decontamination: Liquid Vesicant Gases; AS&SL Jan-Jun 1944, 44-97, p. 345.

The following information is based on recent recommendations submitted by the War Department Technical Bulletin TB MED 101, 4 October 1944. Permission to publish to the Naval Service was granted to BuMed by the War Department.

1. This letter is issued as supplementary to and in amplification of references (a) and (b). The point that the use of BAL in oil does not preclude the necessity for self-decontamination should be emphasized.

2. GENERAL

Lewisite and other arsenical blister gases in liquid form can readily penetrate the human skin and may lead to dangerous systemic poisoning. The severity of the toxic effects is roughly proportional to the amount of the arsenical absorbed per pound of body weight. The amount of arsenical absorbed through the skin from exposure to field concentrations of the vapor of the arsenical agents is too small to cause systemic poisoning. The greater and more extensive the skin contamination with liquid arsenical blister gases and the longer the period of contact before decontamination, the greater will be the amount of arsenical blister gas absorbed. The fatal doses of the arsenical blister gases for man are not known, but 1 to 2 cc of liquid lewisite absorbed through the skin is believed to be sufficient to produce a serious or fatal result. Half this amount may cause alarming symptoms and a protracted illness. A manifestation of this systemic poisoning is a change in capillary permeability which permits the loss of sufficient fluid from the blood stream to cause hemoconcentration, shock and death. In nonfatal cases, hemolysis of erythrocytes has occurred with resultant hemolytic anemia. Although lewisite is oxidized within the body, the oxidation product may still be toxic. Its excretion into bile by the liver produces focal necrosis of that organ, necrosis of the mucosa of the biliary passages with peribiliary hemorrhages, and some injury to the intestinal mucosa. Acute systemic poisoning from large burns in animals causes pulmonary edema, diarrhea, restlessness, weakness, sub-normal temperature, and low blood pressure.

3. PERSONAL DECONTAMINATION

It is important that all liquid arsenical gas be removed from the skin by the injured man himself, by personal decontamination with protective ointment at

the earliest possible moment. If this is done with sufficient promptness to prevent immediate signs of skin damage (a gray or dead white appearance of the outer skin layers) or to prevent the appearance of erythema during the 30 minutes following decontamination, there is little likelihood that a toxic dose of the arsenical will be absorbed.

4. INDICATIONS FOR SYSTEMIC TREATMENT WITH BAL

(a) Cough with dyspnea and frothy sputum, which may be blood tinged, and other signs of pulmonary edema. These are manifestations of early damage to the lung capillary bed caused either by the absorption through the skin of large amounts of the arsenical blister gases or by the inhalation of dangerous amounts of their vapors. Regardless of the portal of entry, serious respiratory damage requires prompt systemic treatment with BAL.

(b) A skin burn the size of the palm of the hand, or larger, caused by a liquid arsenical blister gas, which was not decontaminated within the first 15 minutes: Prompt treatment with BAL ointment locally and BAL in Oil by injection for systemic poisoning is indicated.

(c) A large skin contamination covering 5 per cent (about 1 square foot) or more of the body surface, caused by a liquid arsenical vesicant, provided there is evidence of immediate skin damage (gray or dead white blanching of skin) or erythema develops over the area within 30 minutes. Such extensive contamination may result in dangerous absorption through the skin within 15 minutes even though decontamination has been accomplished within these 15 minutes. Treatment for systemic poisoning with BAL is therefore indicated.

(d) Cases which have been seen late, where there are blisters the size of the palm of the hand or larger.

5. TREATMENT OF SYSTEMIC POISONING WITH BAL

Two types of treatment are required: First, neutralization of the absorbed arsenical by the intramuscular injection of 10 per cent BAL in Oil; and second neutralization of the deposit of liquid arsenical on and within the skin at the site of contamination by the local application of BAL ointment. For the BAL treatment of direct injury to the respiratory tract caused by the inhalation of vapor, only the intramuscular injection of BAL in Oil is used.

6. REACTIONS CAUSED BY BAL IN OIL

The signs and symptoms may include a feeling of constriction in the throat, a sense of oppression in the chest, a burning sensation of the lips, mild lacrimation, slight reddening of the eyes, dryness of the mouth, tenderness and increased muscle tonus at the site of injection, mild restlessness and nervousness accompanied by sweating of the hands, apprehension on the part of some patients, and mild nausea and vomiting, on eating, in a few. There may be a transient rise in blood pressure.

Slight tenderness at the site of injection may persist for several days. All reactions are generally transitory, beginning 15 to 30 minutes after injection

and lasting approximately 30 minutes. Elevation of blood pressure or other reactions, unless unduly severe and prolonged do not contraindicate the continued administration of the full course of four injections of the drug.

7. DOSAGE OF BAL IN OIL

(a) An immediate intramuscular injection of 10 per cent BAL in Oil should be given deep into the muscles of the buttocks. Particular care should be exercised to avoid injecting the solution into a blood vessel. Dosage must be adjusted to the weight of the patient, as follows:

125 pounds - 2.5 c.c.
150 pounds - 3.0 c.c.
175 pounds - 3.5 c.c.
200 pounds - 4.0 c.c.

(b) The intramuscular injection of 10 per cent BAL in Oil should be repeated at different sites in the same general area at 4, 8 and 12 hours after the initial injection, making a total of four intramuscular injections of equal dosage.

(c) If pulmonary symptoms or other evidence of severe arsenical poisoning are present, the interval between the first and second doses may be shortened to 2 hours. In severe cases, subsequent daily intramuscular half doses should be given at the rate of one injection per day for 3 or 4 days. These small doses should produce no symptoms.

8. ESSENTIALS FOR PREVENTION AND BAL TREATMENT OF SYSTEMIC POISONING DUE TO ARSENICAL BLISTER GASES

(a) Prompt self-decontamination with protective ointment.

(b) If any of the indications for systemic treatment exist, as outlined in paragraph 3, protective ointment should be thoroughly removed and the local skin burn should be treated promptly with a liberal inunction of BAL ointment, and left covered with a layer of the ointment.

(c) An immediate intramuscular injection of an appropriate dose of 10 per cent BAL in Oil followed by further injections at proper intervals.

9. MATERIAL

The material is put up in a 10 per cent solution in peanut oil, containing 20 per cent benzyl benzoate as a solvent. It has been added to the Medical Supply Catalog as: Stock No. S1-110 BAL in Oil, 10%, 5-cc ampul, 10 ampules in box, unit - box. It may be obtained on NavMed Form 4 requisition from the Naval Medical Supply Depot, Brooklyn, Naval Medical Supply Depot, Oakland, Naval Medical Supply Depot, Navy 128. Original distribution should be to activities in the forward areas and on the basis of 4 units (40 ampules) per 1,000 men. Requisitions should be submitted to the nearest Naval Medical Supply Depot listed above and material will be furnished at the earliest possible date.

--BuMed. W. J. C. Agnew.

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To: All Ships and Stations. BUMED-WM-CM
L8-2/JJ57(042-43)

Subj: Penicillin Therapy of Early and Latent Syphilis. 13 Feb 1945

Ref: (a) BuMed ltr BuMed-W-EB/L8-2/JJ57(042-43), of 15 Sep 1944; N.D. Bul. of 30 Sep 1944, 44-1119.

Encls: (A) Sample of Form NavMed 621.
(B) Sample of Form NavMed 622.
(C) Sample of Form NavMed 623.

1. Penicillin therapy to date has been free from severe reactions. However, Herxheimer-like reactions have been observed. In those cases of latent syphilis where the stage of latency is unknown and where there may exist some visceral complications of syphilis, untoward reactions are quite possible. Reduction in the number of Oxford units of penicillin in the early doses or lengthening of the time interval between those injections may be indicated. If no reaction has occurred during the first 3 or 4 doses, the recommended schedule can usually be resumed within 24 to 36 hours. The recommended total dosage of 2,400,000 Oxford units of penicillin should, of course, be administered.

2. When penicillin is used for retreatment, in no case shall the dosage be less than the original 2,400,000 units.

3. All cases of syphilis treated by penicillin are to be reported. It is directed that medical officers use the format of the following forms in reporting each case to BuMed, this to supersede previous method of reporting by letter:

(a) NavMed-621 to be forwarded in single copy at completion of therapy.
(b) NavMed-623 to be submitted monthly for one year.
(c) NavMed-622 to be forwarded between the third and sixth month after completion of penicillin treatment.

These three forms may be obtained from any naval medical supply depot and appear in the Navy Medical Department Supply Catalog as follows:

Stock No.	NavMed No.	Item	Unit
S16-3083	621	PENICILLIN THERAPY REPORT - EARLY AND LATENT SYPHILIS	sheet
S16-3090	622	SPINAL FLUID TEST REPORT	sheet
S16-3095	623	MONTHLY KAHN TEST REPORT	20 in pad

--BuMed. W. J. C. Agnew.

* * *

PENICILLIN THERAPY REPORT
EARLY AND LATENT SYPHILIS
NAVMED 621 (1-45)

INSTRUCTIONS
Forward one copy at completion of therapy to Bureau of Medicine and Surgery Washington 25, D.C.

STATION REPORTING _____ DATE _____

NAME *(surname first)*	SERVICE NO.	RANK OR RATE

DATE OF BIRTH	RACE	PATIENT'S WEIGHT *(Pounds)*

DIAGNOSIS *(Indicate)*

☐ EARLY SYPHILIS

☐ LATENT SYPHILIS

INDICATE OPINION WHETHER:

☐ FIRST INFECTION ☐ RELAPSE

☐ REINFECTION

DATE OF ONSET _____

DURATION IN DAYS BEFORE THIS COURSE OF TREATMENT _____

PRETREATMENT TESTS

BLOOD KAHN TEST *(last before treatment)* _____ *(0, ±, 1+ to 4+)*

DARKFIELD _____

SPINAL FLUID TESTS *(required in case of latent syphilis)*

KAHN _____ *(0, ±, 1+ to 4+)*

COLLOIDAL GOLD CURVE *(give figures)* _____

CELL COUNT _____

GLOBULIN *(Pandy)* ☐ POSITIVE ☐ NEGATIVE

PREVIOUS TREATMENT

☐ YES ☐ NO IF "YES", SPECIFY BELOW

PENICILLIN, TOTAL UNITS _____ DATE BEGUN _____ DATE COMPLETED _____

ARSENICALS, TOTAL GRAMS _____ NUMBER OF COURSES _____

DATE FIRST COURSE BEGUN _____ DATE LAST COURSE COMPLETED _____

BISMUTH, TOTAL GRAMS _____ NUMBER OF COURSES _____

DATE FIRST COURSE BEGUN _____ DATE LAST COURSE COMPLETED _____

PRESENT TREATMENT

PENICILLIN, TOTAL UNITS _____ DATE BEGUN _____ DATE COMPLETED _____

MANUFACTURER OF PENICILLIN _____ TYPE _____ LOT _____

TYPE _____ LOT _____

TYPE _____ LOT _____

(Do not fill in blanks below this line; will be completed by BuMed)

RESULT OF MONTHLY KAHN TESTS AFTER COMPLETION OF PENICILLIN TREATMENT

1	2	3	4	5	6	7	8	9	10	11	12

RESULTS OF 3 TO 6 MONTHS FOLLOW-UP SPINAL FLUID TESTS

KAHN _____ CELL COUNT _____ COLLOIDAL GOLD CURVE _____ GLOBULIN _____

SPINAL FLUID TEST REPORT
NAVMED 622 (1-45)

INSTRUCTIONS - Forward this report to BUMED between the third and sixth month after completion of penicillin treatment.

STATION REPORTING _____

DATE

NAME *(Surname first)*

SERVICE NUMBER

KAHN (0, ±, 1+ to 4+)

COLLOIDAL GOLD CURVE *(Give figures)*

CELL COUNT

GLOBULIN *(Pandy)*

☐ POSITIVE ☐ NEGATIVE

PB

MONTHLY KAHN TEST REPORT
NAVMED 623 (1-45)

INSTRUCTIONS - Submit this report to BuMed monthly for one year after treatment of syphilis with penicillin.

STATION REPORTING _____

DATE

NAME *(Surname first)*

SERVICE NUMBER

DATE OF TREATMENT

DATE OF THIS KAHN TEST

RESULT OF KAHN TEST *(0, ±, 1+ to 4+)*

REMARKS

PB

ALNAV 29

Subj: Use of Nupercaine as Anesthetic. BuMed. 2 Feb 1945

Use of Nupercaine as an anesthetic shall be discontinued immediately. Medical Supply Catalog Item Nupercaine S1-3320 on hand shall be turned in to nearest naval medical supply depot or storehouse.

Medical supply facilities discontinue issue. --SecNav. James Forrestal.

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ALNAV 36

Subj: Identification of Bodies. BuMed. 12 Feb 1945

Alnav 5 being misconstrued by some commands to require resubmission of fingerprints of all personnel. Procedure specified in Alnav 5 is for application only to unidentified bodies. --SecNav. Ralph A. Bard.

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To: All Ships and Stations. BUMED-X-BLW:II P3-2

Subj: Cases of Asphyxia Requiring Resuscitative Measures, Reports on. 8 Feb 1945

1. The armed forces have agreed that a clinical study of existing methods used in artificial respiration would be of immense value in the planning and evaluation of measures and devices for this purpose. It is therefore directed that in each case of asphyxia requiring treatment, a report be submitted to the Bureau of Medicine and Surgery, Washington 25, D. C. The following form, to be prepared locally, will be used for submitting subject reports:

REPORT ON CASE OF ASPHYXIA REQUIRING RESUSCITATIVE MEASURES

U. S. Ship or Station .....
(Specify)

Patient's Name ..... Age..... Sex.....

A. Cause of Asphyxia or Anoxia: (Encircle one number)

1. Immersion
2. Electric Shock
3. Injury - Thoracic
4. Injury - Head
5. Suffocation
6. Anesthesia ..... (Specyfy Type)
7. Cardiac
8. Drugs ..... (Specify Drug)
9. Toxic Gas ..... (Specify Gas)
10. Miscellaneous ..... (Specify)
11. Undetermined

B. Elapsed Time (Estimate):

1. From beginning of Asphyxia or Anoxia to time of rescue:
   .....Minutes
2. From time of rescue to application of resuscitative measures:
   .....Minutes

C. Condition of Patient at Time of Rescue:

1. Were mouth and airways clear? .....Yes, ...No
2. Breathing when first observed (Check)
   .....No .....Yes; If Yes, ... Gasping, ... Shallow,
   .....Rapid, ...Weak
   If No, ...Rhythmic motion of edges of nostrils?
3. Pulse palpable or heart beat detectable (Check one):
   .....Yes .....No
4. Color of Skin (Check one):
   .....Red, ...Pale, ...Bluish

D. Resuscitative Measures:

1. List type of Resuscitative Measure, giving (if more than one) order in which used and length of time used.

Type (specify)*	By whom administered[1]	Time used		Remarks
		Hrs.	Mins.	
(a)				
(b)				
(c)				

*Manual, state method; Mechanical, specify type.
[1]E.g., hospital corpsmen, medical officers, etc.

2. Total time Resuscitative Measures Continued: .....Hrs. .....Mins.
3. If Spontaneous breathing began,
   A. Was it supplemented with
      (1) Oxygen .....Yes, ...No. If yes, estimate duration; .....minutes.
      (2) Aid to chest movements by
         (a) Manual methods .....Yes, ...No. If yes, estimate duration; ..... minutes.
         (b) Mechanical methods .....Yes, ...No. If yes, estimate duration; .....minutes.
   B. Time from start of artificial respiration to first spontaneous respiratory effort. .....Hrs. .....Mins.
4. Reason for discontinuing resuscitative measures (Check one): ..... Normal Breathing returned; .....Dead; ....Other
   (Specify)

E. Condition of Patient Following Recovery
1. Complications or Sequelae
   Specify:
2. Length of time on Sick List
   .....Days

F. Critical Comments on Method(s) Used, Including any Suggestions For Improvement of Resuscitative Techniques.

G. Give brief chronological narrative of the incident.

.....Sig.
.....Rank
..... Date
--BuMed. W. J. C. Agnew.

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CIRCULAR LETTER NO. 26-45
To: All Ships and Stations.

PERS-6303-DW-12
P16-3/MM

Subj: Enlisted Personnel - Assignment and Distribution of Hospital Corpsmen.

1 Feb 1945

Ref: (a) BuPers Circ Ltr 348-44; N.D. Bul. of 30 Nov 1944, 44-1322.

1. The policy of assigning hospital corpsmen by name is discontinued. Hereafter, the transfer in hospital corpsmen will be by rate, in lieu of by name, except in unusual cases where personnel are required for specific billets.

2. Assignment and distribution of hospital corpsmen shall be as follows:

"THE BUREAU OF NAVAL PERSONNEL WILL MAKE ASSIGNMENTS OF HOSPITAL CORPSMEN:

TO AND FROM

(a) Commander in Chief, United States Fleet; Flagship and staff.
(b) Ships assigned special duty under the Chief of Naval Operations.
(c) 1st, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 11th, 12th, and 13th Naval Districts, Severn River Naval Command, Potomac River Naval Command, NATechTraComd, NAIntermTraComd, NAOpTraComd, NAPrimTraComd, Naval Airship Training and Experimental Command.
(d) Indoctrination at naval hospitals, including WAVE (HospCorps V-10) personnel.
(e) Instruction at hospital-corps schools and special courses of instruction in medical-department technical specialties. (See subparagraph (e) under assignments by commandants.)
(f) Navy Department. (Includes Naval Dispensary and enlisted hospital corps personnel attached to the Naval Barracks, Washington, D. C. for duty in the Navy Department.)
(g) Naval Missions.
(h) Recruiting and Induction Service.
(i) Naval Officer Procurement Offices.
(j) Office of Strategic Services, Naval Unit.
(k) The Commander Service Force, Atlantic Fleet (Subordinate Command), and Commander Western Sea Frontier (Subordinate Command Service Force Pacific Fleet).
(l) USS Semmes.

TO

(m) New construction (except submarines), acquired ships, special projects, and advance base components until such ships, projects, or advance base components report to a fleet commander or other command charged with the assignment and distribution of personnel, at which time they shall come under that command.

(n) Construction battalion units being formed at construction battalion activities on the east and west coasts. Upon arrival and attachment of hospital corpsmen to construction battalion units at construction battalion training centers, construction battalion advance base receiving barracks and construction battalion replacement depots on the respective coasts, prior to departure outside and upon return to the continental limits of the United States, they will be administered by Service Force, Subordinate Command, Atlantic Fleet and Commander Western Sea Frontier (Subordinate Command Service Force Pacific Fleet). Hospital corpsmen attached to ships' companies of construction battalion training centers, construction battalion advance base receiving barracks and the construction battalion replacement depot shall be administered by commandants of naval districts in the same manner as for other district personnel.

FROM

(o) General detail at receiving ships and receiving stations in the United States.

THE COMMANDER SERVICE FORCE ATLANTIC FLEET (SUBORDINATE COMMAND) IS CHARGED WITH THE ASSIGNMENT AND DISTRIBUTION OF HOSPITAL CORPSMEN UNDER THE DIRECTION OF THE COMMANDER IN CHIEF, ATLANTIC FLEET, AS FOLLOWS:

(A) (a) Atlantic Fleet, including all hospital corpsmen attached to the U. S. Marine Corps activities serving with and under the jurisdication of the fleet, (b) U. S. Navy fleet hospitals and hospital facilities assigned to the Atlantic Fleet on outlying bases in the Atlantic, (c) construction battalions immediately upon arrival at a construction battalion training center, construction battalion advance base receiving barracks or a construction battalion replacement depot on the Atlantic or Gulf Coast prior to departure outside and upon return to the United States, (d) the Field Medical School, Fleet Marine Force, New River, N. C.

(B) All other forces, including outlying naval districts and activities assigned to the Atlantic Fleet for administrative purposes.

THE COMMANDER WESTERN SEA FRONTIER (SUBORDINATE COMMAND SERVICE FORCE PACIFIC FLEET) IS CHARGED WITH THE ASSIGNMENT AND DISTRIBUTION OF HOSPITAL CORPSMEN, UNDER THE DIRECTION OF THE COMMANDER IN CHIEF, PACIFIC FLEET, AS FOLLOWS:

(A) Pacific Fleet, including all hospital corpsmen attached to (a) U. S. Marine Corps activities serving with and under the jurisdiction of the fleet, (b) U. S. Navy fleet hospitals and hospital facilities assigned to the Pacific Fleet, (c) construction battalions immediately upon arrival at a construction battalion training center, construction battalion advance base receiving barracks or the construction battalion replacement depot on the Pacific Coast prior to departure outside and upon return to the United States, (d) the Field Medical School, Fleet Marine Force, San Diego Area, Camp Joseph H. Pendleton, Oceanside, California.

(B) All other forces, including outlying naval districts and activities assigned to the Pacific Fleet for administrative purposes.

The commandants of all naval districts, the Commandant of the Severn River Naval Command, the Commandant of the Potomac River Naval Command, and Chiefs of Air Functional Training Commands, will make assignments of enlisted hospital corpsmen, including V-10 personnel and including hospital-corps ratings of ships' companies of construction battalion training centers, construction battalion advance base receiving barracks and the construction battalion replacement depot, within their districts and commands, including all new activities, and all ships in commission and in service assigned to the districts or commands; except activities under the direct administrative control of BuPers, those assigned to the Atlantic and Pacific Fleets and units under the jurisdiction of the Commanding General, Marine Barracks, Parris Island, S. C., and the Commanding General, Quantico, Va.

(a) The Commandant, Sixth Naval District, will make assignments of hospital corpsmen to and from the Commanding General, Marine Barracks, Parris Island, S. C., and will include hospital corps ratings attached to the Commanding General, Marine Barracks, Parris Island, S. C.,in weekly combined report of hospital-corps ratings on board submitted to BuMed.

(b) The Commandant, Potomac River Naval Command, will make assignment of hospital corpsmen to and from the National Naval Medical Center, Bethesda, Md., Marine Barracks, Washington, D. C., the Commanding General, Quantico, Va., and will include hospital-corps ratings attached to above commands in weekly combined report of hospital-corps ratings on board submitted to BuMed.

(c) The Chief of Naval Air Training is authorized to make transfers of hospital-corps personnel between the Naval Air Operations, Naval Air Intermediate, and Naval Air Primary Training Commands without reference to the Bureau.

(d) The Commanding General, Marine Barracks, Parris Island, S. C., and the Commanding General, Quantico, Va., will make assignments of hospital-corps personnel to duties in the activities under their jurisdiction.

(e) Hospital corpsmen assigned to courses of instruction in medical-department technical specialties by authority of BuPers directives and are subsequently found to be not qualified to continue under instruction by their commanding officer shall be dropped from instruction and assigned to other duty by the commandant."

3. Reference (a) is modified by deleting all reference to hospital-corps assignments where appearing, and inserting as an addenda thereto the specific instructions pertaining to the assignment of hospital-corps ratings as detailed in paragraph 2 above. - BuPers. L. E. Denfeld.

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